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BOOK REVIEWS AND NOTES.

THE DYNAMICS OF LIVING MATTER. By *Jacques Loeb*. New York: Macmillan, 1906. Pp. 233. Price, \$3.00 net.

In the year 1902 Professor Loeb was called to Columbia University to deliver a series of eight lectures on the dynamics of living matter, and this series now lies before us in book form as Vol. VIII of the Columbia University Biological Series. Professor Loeb says:

"In these lectures we shall consider living organisms as chemical machines, consisting essentially of colloidal material, which possess the peculiarities of automatically developing, preserving, and reproducing themselves. The fact that the machines which can be created by man do not possess the power of automatic development, self-preservation, and reproduction constitutes for the present a fundamental difference between living machines and artificial machines. We must, however, admit that nothing contradicts the possibility that the artificial production of living matter may one day be accomplished. It is the purpose of these lectures to state to what extent we are able to control the phenomena of development, self-preservation, and reproduction."

Professor Loeb incorporates or at least alludes to his prior work which has brought him prominently before the public, and he discusses the dynamics of life in the following chapters: Concerning the General Chemistry of Life Phenomena, The General Physical Constitution of Living Matter, On Some Physical Manifestations of Life, The Rôle of Electrolytes in the Formation and Preservation of Living Matter, The Effects of Heat and Radiant Energy Upon Living Matter, Heliotropism, Further Facts Concerning Tropisms and Related Phenomena, Fertilization, Heredity, On the Dynamics of Regenerative Processes.

Professor Loeb excludes from the present volume those actions of animals which are executed consciously because he discusses them in a special book, but he refers to the purely psychic phenomena in these words:

"I consider consciousness the function of a definite machine or mechanism, which we may call the mechanism of associative memory. Whatever the nature of this machine may be it has one essential feature in common with the phonograph, namely, that it reproduces impressions in the same chronological order as that in which they were received. The mechanism of associative memory seems to be located—in vertebrates—in the cerebral hemispheres. It follows from the experiments of Goltz that one of the two hemispheres is sufficient for all the phenomena of memory and consciousness.

As far as the chemical or physical mechanism of memory is concerned, we have at present only a few vague data. H. Meyer and Overton have pointed out that substances which are easily soluble in fat are also, for the most part, strong anæsthetics, e. g., ether, chloroform, etc., and that the ganglionic cells are especially rich in lipoids. It is possible that the mechanism of associative memory depends in part upon the properties and activities of the fatty constituents of the cerebral hemispheres. Another fact which may be of importance is the observation of Speck that if the partial pressure of oxygen in the air is lowered to below one third of its normal value, the fundament of mental activity, namely, memory, is almost instantly interfered with, and total loss of consciousness rapidly follows."

HARVARD ORIENTAL SERIES. Vols. VII-VIII. — ATHARVA-VEDA SAMHITA.

Translated with a Critical and Exegetical Commentary by *William Dwight Whitney*. Revised and brought nearer to completion and edited by *Charles Rockwell Lanman*.

Vol. IX. THE LITTLE CLAY CART. Attributed to *King Shudraka* and translated into English prose and verse by *Arthur William Ryder*. Cambridge: Harvard University 1905.

The Atharva-Veda is one of the most ancient and venerable collections of Brahman lore that has come down to us. It contains incantations, hymns, exorcisms for all possible purposes, and thus forms an important landmark in the development of religion. An elegant birch bark manuscript has been found in Kashmir, which is now in possession of the University of Tübingen, and was edited as an edition de luxe several years ago by the Professors Richard Garbe and Maurice Bloomfield. A translation into German was made some time ago by Professor Weber in *Indische Studien*, Vol. IV, 1858, pp. 393 to 430. The present translation, the first one into English, is the work of the late Whitney, which has been edited and in some unfinished portions brought to completion by Professor Lanman. Professor Roth was the first to understand the significance of this ancient work, and he inspired his disciple Whitney to undertake a translation which he had almost completed, when death prevented him from giving the finishing touches to it. So the work of bringing it before the public was left to Professor Whitney's disciple and friend, Charles R. Lanman, and it could not have been put in better hands. He has not only faithfully attended to the labor of making the manuscript ready for publication, but has revised and added and brought up to date those parts of the material which had been left incomplete, and work has been done with reverence and love for the master at whose feet he had sat. A Sanskrit poem at the end of the preface bears testimony to the spirit which animated Lanman. Thus this stupendous work becomes a monument not only to ancient religion but also to true scholarship, and the editor gives expression to his feelings in the following words and verses:

"Had Whitney lived to see this work in print and to write the preface, his chief tribute of grateful acknowledgement would doubtless have been to his illustrious preceptor and colleague and friend whose toil had so largely increased its value, to Rudolph Roth of Tübingen. Whitney, who was my teacher, and Roth, who was my teacher's teacher and my own teacher, both are passed away, and Death has given the work to me to finish, or rather to